

A woman with dark hair, wearing safety glasses and a dark blue polka-dot lab coat, is focused on a task in a laboratory. She is holding a white pipette tip and a small vial. The background is a blurred laboratory setting with various pieces of equipment.

May 21, 2021

Technology-Enabled

DISRUPTION

IMPLICATIONS FOR
BUSINESS, LABOR MARKETS
AND MONETARY POLICY



Federal Reserve
Bank of Dallas



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This conference is designed to provide a better understanding of the phenomenon of technology-enabled disruption and explore its implications for the broader economy—in particular, labor markets and the workforce.

Technology-enabled disruption means that workers are increasingly being replaced by technology. It also means that existing business models are being supplanted by new models, often technology-enabled, that bring more efficiency to the sale or distribution of goods and services. As part of this phenomenon, consumers are increasingly able to use technology to shop for goods and services at lower prices with greater convenience—which has the impact of reducing the pricing power of businesses. This reduced pricing power, in turn, causes businesses to further intensify their focus on creating greater operational efficiencies. These trends appear to be accelerating.

It is likely that disruption is becoming a greater factor in the economic outcomes of workers. Increasingly, workers with lower levels of educational attainment are seeing their jobs restructured or eliminated. Unless they have sufficient math and literacy skills, or are retrained, these workers may see their productivity and incomes decline as a result of disruption. Thus, disruption may help explain

the muted wage gains and overall labor productivity growth we have seen in the U.S. as well as in other advanced economies during much of the recovery from the global financial crisis.

Technology-enabled disruption's impact on the workforce is likely not susceptible to monetary policy—it requires structural reforms. The reforms could include improving early-childhood literacy and overall college readiness in order to increase the percentage of students who graduate from college in six years or less (a share now estimated at 59 percent in the U.S.). The reforms could also include stepped-up efforts to increase middle-skills training in cities across the U.S. in order to increase employment, close the skills gap (not enough workers to fill skilled jobs) and raise worker productivity.

It is also likely that disruption is a factor behind some business decisions made by companies that are facing one or more disruptive competitors. These companies may be more cautious about making capacity-expansion decisions and investing in major capital projects.

To deal with disruptive changes and lack of pricing power, many companies are seeking greater economies of scale in order to maintain or improve profit margins. This may help explain the record merger-and-acquisition activity globally over the past few years.

8:15 a.m.

Introduction and Opening Remarks

Robert S. Kaplan

Federal Reserve Bank of Dallas

Mark A. Wynne

Federal Reserve Bank of Dallas

James Bessen

Boston University School of Law

Diane Coyle

Bennett Institute for Public Policy,
University of Cambridge

Willy Shih

Harvard Business School

Catherine Tucker

MIT Sloan

8:30 a.m.

Technology-Enabled Disruption— A Conversation

Moderator: Robert S. Kaplan

Nitin Nohria

Harvard Business School

Ross Perot Jr.

The Perot Group and Hillwood

Steven Williams

PepsiCo Foods North America

11:00 a.m.

Break

11:15 a.m.

Policymaker Roundtable

Moderator: Kathleen Hays

Bloomberg

Thomas I. Barkin

Federal Reserve Bank of Richmond

Raphael Bostic

Federal Reserve Bank of Atlanta

Robert S. Kaplan

9:30 a.m.

The Economics of Technological Change

Chair: Kartik Athreya

Federal Reserve Bank of Richmond

AGENDA | May 21, 2021

12:30 p.m.

Break

3:00 p.m.

Break

1:00 p.m.

**The Future of Work:
Framing the Debate**

Chair: Marc P. Giannoni
Federal Reserve Bank of Dallas

Joseph Fuller
Harvard Business School

3:05 p.m.

Directions for Future Research

Chair: Karel Mertens
Federal Reserve Bank of Dallas

Kartik Athreya

Marc P. Giannoni

Paula Tkac
Federal Reserve Bank of Atlanta

1:45 p.m.

**The Future of Work:
Preparing the Workforce
of the Future**

Chair: Pia Orrenius
Federal Reserve Bank of Dallas

Tamar Jacoby
Opportunity America

Joe May
Dallas College

William Serrata
El Paso Community College

3:55 p.m.

Concluding Remarks

Robert S. Kaplan

Mark A. Wynne

4:00 p.m.

Adjourn

SPEAKER BIOS

Kartik Athreya

Executive Vice President and Director of Research

Federal Reserve Bank of Richmond

Athreya is executive vice president and director of research at the Federal Reserve Bank of Richmond.

His work has been published in a variety of academic journals, including the *Journal of Monetary Economics*, *American Economic Journal: Macroeconomics* and *International Economic Review*. He is also an associate editor at the *Journal of Economic Dynamics and Control* and the author of *Big Ideas in Macroeconomics*.

Recently, Athreya taught a doctoral course in macroeconomics at the University of Virginia.

Athreya earned a PhD in economics from the University of Iowa.

SPEAKER BIOS

Thomas I. Barkin

President and CEO

Federal Reserve Bank of Richmond

Barkin is president and CEO of the Federal Reserve Bank of Richmond. He joined the Richmond Fed in January 2018.

He is responsible for the Bank's monetary policy, bank supervision and regulation, and payment services, as well as oversight of the Federal Reserve System's information technology organization. Barkin also serves on the Federal Reserve's chief monetary policy body, the Federal Open Market Committee.

Prior to joining the Richmond Fed, Barkin was a senior partner and chief risk officer at McKinsey and Co., a worldwide management consulting firm, and he previously served as the organization's chief financial officer. He also served on the board of directors for the Federal Reserve Bank of Atlanta from 2009 to 2014 and was the board's chairman from 2013 to 2014.

Barkin has held leadership roles with organizations that include the Metro Atlanta Chamber of Commerce, the Atlanta Committee for Progress, the Commerce Club and the Emory University Board of Trustees.

He earned undergraduate, MBA and law degrees from Harvard University.

SPEAKER BIOS

James Bessen

Economist and Executive Director, Technology & Policy Research Initiative Boston University School of Law

Bessen, an economist, serves as executive director of the Technology & Policy Research Initiative at the Boston University School of Law. He has also been an innovator and CEO of a software company. He has done research on the impacts of automation, how information technology has contributed to rising industry concentration, whether patents promote innovation, and how technology affects jobs, skills and wages.

With Michael J. Meurer, Bessen wrote *Patent Failure*, which highlights the problems caused by poorly defined property rights. Bessen's book, *Learning by Doing: The Real Connection Between Innovation, Wages and Wealth*, looks at history to understand how new technologies affect wages and skills today.

Bessen's work has been widely cited in the press as well as by the U.S. White House and Supreme Court, the European Parliament and the Federal Trade Commission.

Raphael Bostic

President and CEO

Federal Reserve Bank of Atlanta

Bostic became the 15th president and CEO of the Federal Reserve Bank of Atlanta in June 2017. He is a participant on the Federal Open Market Committee, the monetary policymaking body of the Federal Reserve System.

From 2012 to 2017, Bostic was the Judith and John Bedrosian Chair in Governance and the Public Enterprise at the Sol Price School of Public Policy at the University of Southern California (USC).

He also served USC's Lusk Center for Real Estate as the interim associate director from 2007 to 2009 and as the interim director from 2015 to 2016. From 2016 to 2017, he was the chair of the center's Governance, Management and Policy Process Department.

From 2009 to 2012, Bostic was the assistant secretary for policy development and research at the U.S. Department of Housing and Urban Development (HUD).

Bostic worked at the Federal Reserve Board of Governors from 1995 to 2001. He served as special assistant to HUD's assistant secretary of policy development and research in 1999. He was also a professional lecturer at American University in 1998.

He has previously served on many boards and advisory committees.

Bostic graduated from Harvard University with a combined major in economics and psychology. He holds a doctorate in economics from Stanford University.

SPEAKER BIOS

Diane Coyle

Co-director, Bennett Institute for Public Policy
Bennett Professor of Public Policy
Cambridge University

Coyle is the Bennett Professor of Public Policy at the University of Cambridge, where she co-directs the Bennett Institute and its research on progress and productivity. She has been a government adviser on economic policy, including throughout the COVID-19 pandemic.

Her latest book, *Markets, State and People—Economics for Public Policy*, examines how societies reach decisions about the use and allocation of economic resources. Her other books include *GDP: A Brief But Affectionate History*; *The Economics of Enough*; *The Soulful Science*; *Sex, Drugs and Economics*; *Paradoxes of Prosperity*; *Governing the World Economy*; and *The Weightless World*.

She is also a director of the Productivity Institute, a fellow of the Office for National Statistics, an expert adviser to the National Infrastructure Commission and Senior Independent Member of the Economic and Social Research Council. She has served in public service roles including as vice chair of the BBC Trust, member of the Competition Commission, of the Migration Advisory Committee and of the Natural Capital Committee.

Coyle was professor of economics at the University of Manchester until March 2018 and was awarded a CBE for her contribution to the public understanding of economics in the 2018 New Year Honours.

She is a graduate of Oxford University and holds a PhD in economics from Harvard University.

SPEAKER BIOS

Joseph Fuller

Professor of Management Practice in General Management Harvard Business School

Fuller is a professor of management practice in general management at Harvard Business School and co-leads the school's initiative, Managing the Future of Work.

His research has probed the “skills gap” and investigates the paradox that many employers have chronic difficulty filling jobs while millions of Americans remain unemployed, under-employed or have left the workforce. His current research focuses on the future of work more broadly, including mechanisms employers can use to address the skills gap and the implications of changing demographics and the growth of the gig economy for companies. He also currently teaches the Becoming a General Manager course in the second year of the MBA program.

He was a founder and first employee of the global consulting firm, Monitor Group, now Monitor-Deloitte. During his three decades in consulting, Fuller worked with senior executives and policymakers on a wide variety of issues related to corporate strategy and national competitiveness. He has particularly deep experience in industries with a heavy reliance on technology.

Fuller is a graduate of Harvard College.

SPEAKER BIOS

Marc P. Giannoni

Senior Vice President and Director of Research

Federal Reserve Bank of Dallas

Giannoni is senior vice president and director of research at the Dallas Fed. He joined the Bank in September 2017.

Giannoni previously was research economist and assistant vice president in the macro-economic and monetary studies function of the Federal Reserve Bank of New York. He is a native of Switzerland and began his career as an economist with the Swiss National Bank in Zurich in 1992.

He joined the New York Fed as an economist in 2000 before leaving to begin an academic career at the Columbia University Graduate School of Business. He rejoined the New York Fed in 2011 while continuing as an adjunct professor of finance and economics at Columbia.

He holds BA and MA degrees in economics from the University of Geneva in Switzerland and MA and PhD degrees in economics from Princeton University.

SPEAKER BIOS

Kathleen Hays

Global Economics and Policy Editor

Bloomberg Television and Radio

Hays is global economics and policy editor for Bloomberg Television and Radio, covering economies and central banks around the world, from the Federal Reserve and the European Central Bank to the Bank of Japan and the People's Bank of China.

She can be seen and heard on “Bloomberg Daybreak: Asia” and “Bloomberg Asia Markets” and on Bloomberg Radio’s “Bloomberg Markets P.M.” She has covered the U.S. economy and the Federal Reserve for more than 30 years. For the past two years, she has broadened her coverage to include the economies and central banks of Asia.

Hays joined Bloomberg in 2006 after years as an on-air and online economics correspondent at CNBC and CNN, where she served as a host, correspondent and commentator for numerous programs. She began her career as the New York bureau chief at Markets News International, a financial news service. From there, she joined Reuters and later worked as an economics correspondent and New York bureau chief for *Investor's Business Daily*.

She attended Stanford University, where she earned a bachelor's degree and master's degree in economics.

SPEAKER BIOS

Tamar Jacoby

President and CEO

Opportunity America

Jacoby is president of Opportunity America, a Washington-based nonprofit working to promote economic mobility—work, skills, careers, ownership and entrepreneurship for poor and working Americans. Before founding Opportunity America, she was president of the nonprofit advocacy group, ImmigrationWorks USA.

A former journalist and author, she was a senior writer and justice editor at Newsweek and, before that, the deputy editor of *The New York Times* op-ed page. She is the author of *Someone Else's House: America's Unfinished Struggle for Integration*. Her edited volumes include *Reinventing the Melting Pot: The New Immigrants and What It Means to Be American* and “This Way Up: New Thinking About Poverty and Economic Mobility.”

Jacoby holds a BA from Yale University.

SPEAKER BIOS

Robert S. Kaplan

President and CEO

Federal Reserve Bank of Dallas

Kaplan has served as president and CEO of the Federal Reserve Bank of Dallas since September 2015. He represents the Eleventh Federal Reserve District on the Federal Open Market Committee in the formulation of U.S. monetary policy and oversees the 1,300 employees of the Dallas Fed.

He was previously the Martin Marshall Professor of Management Practice and a senior associate dean at Harvard Business School. Prior to joining Harvard in 2006, Kaplan was vice chairman of Goldman Sachs Group Inc. He is the author of several books on leadership and management.

Kaplan serves as co-chairman of Project A.L.S. and co-chairman of the Draper Richards Kaplan Foundation, a global venture philanthropy firm that invests in developing nonprofit enterprises dedicated to addressing social issues. He is also a board member of Harvard Medical School.

Kaplan holds a bachelor's degree in business administration from the University of Kansas and an MBA from Harvard Business School.

SPEAKER BIOS

Joe May

Chancellor

Dallas College

May has served seven years as chancellor of Dallas College, previously known as Dallas County Community College District. Under his leadership, the college is taking responsibility for many issues, including regional workforce needs, growth of minority-owned businesses, the negative impacts of income disparity and providing opportunity equality. He led the consolidation of seven separate colleges into a single institution.

Because of his commitment to diversity, equity and inclusion, May serves as the founding president of Rebuilding America's Middle Class (RAMC), a national consortium of community colleges.

He strongly believes in collaborative efforts and has worked closely with public school districts, sponsored charter schools, career academies, early college high schools and P-TECH high schools.

May previously served as president of the Louisiana Community and Technical College System, president for the Colorado Community College System, and Pueblo Community College president before accepting the system's CEO position. He also served in leadership roles at Sul Ross State University in Alpine, Texas; Navarro College in Corsicana, Texas; and Vernon College in Vernon, Texas.

He holds a Bachelor of Science and a Master of Education from Stephen F. Austin State University. He earned his doctorate in education from Texas A&M–Commerce.

Karel Mertens

Senior Economic Policy Advisor

Federal Reserve Bank of Dallas

Mertens joined the Federal Reserve Bank of Dallas as senior economic policy advisor in June 2017.

His research interests include business cycles, fiscal policy, banking and monetary economics, empirical macroeconomics and time series econometrics. His recent work focuses on the macroeconomic effects of fiscal and credit policies.

Prior to joining the Bank, Mertens was an associate professor of economics at Cornell University, and he previously served as the editor-in-chief of *The B.E. Journal of Macroeconomics*. He is a research fellow at the Center of Economic Policy Research and a former research associate at the National Bureau of Economic Research.

Mertens is a native of Belgium and holds a licentiaat in economics from Ghent University, an MSc in economics from the London School of Economics and a PhD in economics from the European University Institute.

SPEAKER BIOS

Nitin Nohria

Distinguished Service Professor

Harvard Business School

Nohria is Distinguished Service Professor at Harvard Business School. He served as the 10th dean of Harvard Business School from 2010 to 2020. He previously served as co-chair of the Leadership Initiative, senior associate dean of faculty development, and head of the Organizational Behavior Unit. His intellectual interests center on human motivation, leadership, corporate transformation and accountability, and sustainable economic and human performance.

He is co-author or co-editor of 16 books. He is also the author of over 50 journal articles, book chapters, cases, working papers and notes. He has served as an adviser and consultant to several large and small companies in different parts of the world. He has been interviewed by ABC, CNN and NPR, and cited in *Business Week*, *The Economist*, *Financial Times*, *Fortune*, *The New York Times* and *The Wall Street Journal*.

Nohria holds a B. Tech. in chemical engineering from the Indian Institute of Technology, Bombay (which honored him as a distinguished alumnus in 2007). He received his PhD in management from the Sloan School of Management, Massachusetts Institute of Technology.

SPEAKER BIOS

Pia Orrenius

Vice President and Senior Economist

Federal Reserve Bank of Dallas

Orrenius is a labor economist working on regional economic growth and demographic change. She manages the regional and microeconomics group in the Dallas Fed Research Department, is executive editor of the quarterly publication *Southwest Economy* and co-edited *Ten Gallon Economy: Sizing Up Economic Growth in Texas*. Her academic research focuses on the labor market impacts of immigration, unauthorized immigration and U.S. immigration policy. She is co-author of the book *Beside the Golden Door: U.S. Immigration Reform in a New Era of Globalization*.

Orrenius is affiliated with several academic institutions. She is research fellow at the Tower Center for Public Policy and International Affairs and the Mission Foods Texas–Mexico Center at Southern Methodist University and at the IZA Institute of Labor in Bonn, Germany, as well as adjunct scholar at the American Enterprise Institute. She is also adjunct professor at Baylor University (Dallas campus), where she teaches in the executive MBA program. Orrenius was senior economist on the Council of Economic Advisers in the Executive Office of the President, Washington D.C., in 2004–05, where she advised the Bush administration on labor, health and immigration issues.

She holds bachelor degrees in economics and Spanish from the University of Illinois at Urbana–Champaign and a PhD in economics from the University of California at Los Angeles.

SPEAKER BIOS

Ross Perot, Jr.

Chairman

The Perot Companies and Hillwood

Perot serves as chairman of The Perot Group, which manages the various Perot family interests that include real estate, oil and gas, and financial investments. Additionally, he is chairman of Hillwood, a Texas-based, leading global real estate development company he founded in 1988.

That same year, Perot developed Fort Worth Alliance Airport, the country's first industrial airport, through a unique public-private partnership. The airport now anchors AllianceTexas, a 27,000-acre master-planned, mixed-use community in North Texas.

Perot is co-founder of Perot Systems Corp. and served in various roles within the company including CEO, chairman of the board and member of its board of directors. Perot Systems was acquired by Dell Inc. in 2009, at which time, Perot joined their board of directors on which he served until 2013.

Perot currently serves on the board of the U.S. Chamber of Commerce and was also selected as a member of President Trump's Economic Revival Task Force. He currently sits on the board of the American Enterprise Institute and is Board Member Emeritus for both Vanderbilt University and the Smithsonian National Air and Space Museum.

He holds a bachelor's in business administration from Vanderbilt University.

SPEAKER BIOS

William Serrata

President

El Paso Community College

Serrata was named president of the El Paso County Community College District in 2012. Under his leadership, in fall 2014, El Paso Community College was named one of 10 nationwide finalists for the Aspen Institute prize for community college excellence.

Serrata previously served as the vice president for student affairs and enrollment management at South Texas College in McAllen for more than seven years.

He has presented at numerous national and state conferences. Serrata is a recipient of the National Institute for Staff and Organizational Development Excellence Award.

Serrata holds a BA in English from Texas A&M University, an MA in English from the University of Texas at Brownsville and a PhD in educational human resource development from Texas A&M University.

SPEAKER BIOS

Willy Shih

Professor of Management Practice Harvard University

Shih is the Robert and Jane Cizik Professor of Management Practice in Business Administration at Harvard Business School. He is part of the technology and operations management unit, and he teaches in the MBA and executive education programs.

His expertise is in manufacturing and product development, and he has written or co-authored numerous cases and teaching materials in such industries as semiconductors, IT and consumer electronics. His paper, “Restoring American Competitiveness,” co-authored with Gary Pisano, won the 2009 McKinsey Award.

Prior to joining Harvard in 2007, Shih spent 28 years in industry at IBM, Digital Equipment, Silicon Graphics, Eastman Kodak and Thomson SA.

He has two SB degrees from the Massachusetts Institute of Technology and a PhD from the University of California, Berkeley.

SPEAKER BIOS

Paula Tkac

Senior Vice President and Associate Director of Research

Federal Reserve Bank of Atlanta

Tkac is a senior vice president and associate director of research at the Federal Reserve Bank of Atlanta. She leads the financial markets and micro/macro research economics teams, serves as a policy adviser and provides strategic direction for the research division.

Tkac conducts research on various financial market topics including investor decision-making, the mutual fund industry, financial regulation, and the recent financial crisis and policy responses. Her research has won two William F. Sharpe Awards at the *Journal of Financial and Quantitative Analysis*.

In addition to publishing in academic journals, Tkac frequently speaks to academic and practitioner groups and has appeared on C-SPAN and as an op-ed writer in *The Wall Street Journal*.

Before she joined the Federal Reserve Bank of Atlanta in 2000, Tkac was on the faculty of the finance department at the University of Notre Dame.

Tkac earned her bachelor's, master's, and doctoral degrees in economics from the University of Chicago.

SPEAKER BIOS

Catherine Tucker

Sloan Distinguished Professor of Management Science and Professor of Marketing

MIT Sloan

Tucker is the Sloan Distinguished Professor of Management and a professor of marketing at MIT Sloan at Massachusetts Institute of Technology. She is also chair of the MIT Sloan PhD program.

Her research interests lie in how technology allows firms to use digital data and machine learning to improve performance and the challenges this poses for regulation. Her research studies the interface between marketing, the economics of technology and law.

She has received an NSF CAREER Award for her work on digital privacy, the Erin Anderson Award for an Emerging Female Marketing Scholar and Mentor, the Garfield Economic Impact Award for her work on electronic medical records, the Paul E. Green Award for contributions to the practice of marketing research, the William F. O'Dell Award for most significant, long-term contribution to marketing, and the INFORMS Society for Marketing Science Long-Term Impact Award.

Tucker is co-editor at *Quantitative Marketing and Economics*, associate editor at *Management Science*, *Marketing Science* and the *Journal of Marketing Research*, and a research associate at the National Bureau of Economic Research.

She holds a BA from the University of Oxford and a PhD in economics from Stanford University.

Steven Williams

CEO

PepsiCo Foods North America

Williams is currently the CEO of PepsiCo Foods North America, leading the \$18 billion snack and convenient foods business that includes Frito-Lay North America (FLNA) and Quaker Foods North America (QFNA).

Williams, a 20-year PepsiCo veteran, has served as CEO since March 29, 2019. Prior to this role, he served as senior vice president and chief commercial officer for Frito-Lay's U.S. organization.

He also previously served as senior vice president and general manager for Frito-Lay's Eastern Division. He was responsible for the overall business and performance management for the six geographic regions in the eastern U.S.

Earlier in his tenure at PepsiCo, Williams led the company's global Walmart business, managing the PepsiCo portfolio of products across all aspects of the Walmart business worldwide, including Walmart U.S., Sam's Club and Walmart International Divisions.

Williams also previously led sales for a number of PepsiCo's largest food and beverage brands, leading multichannel and cross-functional teams to deliver revenue, profit and growth.

Williams joined PepsiCo in 2001 as part of PepsiCo's acquisition of the Quaker Oats Company, which he joined in 1997.

He holds a BA in economics from the University of Central Oklahoma and is a graduate of the Program for Leadership Development at Harvard Business School.

SPEAKER BIOS

Mark A. Wynne

Vice President, Associate Director of Research and Director of the Globalization and Monetary Policy Institute

Federal Reserve Bank of Dallas

Wynne is vice president, associate director of research and director of the Globalization and Monetary Policy Institute at the Dallas Fed. In the latter role, Wynne is responsible for developing and leading the Bank's research program on globalization and understanding its implications for the conduct of U.S. monetary policy.

Since joining the Dallas Fed in 1989, Wynne has had a variety of responsibilities, including briefing the Bank's president on national and international economic conditions prior to meetings of the Federal Open Market Committee, providing updates on key economic issues to the Bank's board of directors and conducting research on the effects of fiscal policy, understanding business cycles, inflation measurement and the workings of monetary unions, among other topics. His research has appeared in many of the leading peer-reviewed academic journals and Federal Reserve publications.

Most of his professional career has been at the Dallas Fed, but Wynne also spent time at the European Monetary Institute and European Central Bank. Wynne has also taught at numerous universities and also served as a faculty member for the American Bankers Association Stonier Graduate School of Banking.

Wynne earned BA and MA degrees from the National University of Ireland–University College, Dublin, and holds MA and PhD degrees in economics from the University of Rochester.

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